

ABSTRACT

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Title of Thesis: Evaluation of the nutritional substrates oxidation and energy expenditure in polytrauma patients on nutritional support

The aim of this study was to determine and demonstrate the influence of nutritional support on energy expenditure and nutritional substrate oxidation in polytrauma patients in the intensive care unit, because is not well known.

The study was performed on 14 patients in critical condition (11 men and 3 women). Their mean age was $45,29 \pm 17,67$ years. Examinations were obtained after at least 4 hours nutritional support administration. Energy expenditure and nutritional substrate oxidation were measured by indirect calorimetry under standard condition. Bioimpedance analysis using body composition monitor was used to determine values overhydration.

From a relatively large number of results was demonstrated that the intake of energy in $\text{kcal} \cdot \text{kg}^{-1} \cdot 24 \text{ hours}^{-1}$ ($p = 0,0125$; $r = -0,6461$), carbohydrates in $\text{g} \cdot \text{kg}^{-1} \cdot 24 \text{ hours}^{-1}$ ($p = 0,0108$; $r = -0,6563$), proteins in $\text{g} \cdot \text{kg}^{-1} \cdot 24 \text{ hours}^{-1}$ ($p = 0,0017$; $r = -0,7576$) reduces protein oxidation in $\text{g} \cdot \text{kg}^{-1} \cdot 24 \text{ hours}^{-1}$ which the body did not use as an energy source, but most likely for regenerative and reparative processes of damaged tissues.

The metabolism of polytrauma patients represents a highly individual condition. Accurate determination of resting energy expenditure is possible using by indirect calorimetry. If the value of the non-protein respiratory quotient is known, the degree of preference nutritional substrates oxidation can also be determined. This knowledge will be applied in clinical practice for setting of protein doses and optimization of the nutritional support composition thereby it can significantly contribute to increase the survival probability in critically ill patients.

Keywords: critically ill patient, resting energy expenditure, indirect calorimetry, metabolism